

Case 3507***Phylloporina* Ulrich in Foerste, 1887 (Bryozoa, Fenestrata, Phylloporinina): proposed designation of *Retepora trentonensis* Nicholson, 1875 as the type species**

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Abstract. The purpose of this application, under Article 81.1, is to set aside *Retepora angulata* Hall, 1852 and *Retepora angulata* Hall as applied by Foerste, 1887 as type species of the Palaeozoic bryozoan genus *Phylloporina* Ulrich in Foerste, 1887 and to designate *Retepora trentonensis* Nicholson, 1875 as the type species. Both *R. angulata* and *R. trentonensis* have been cited as type species of the cosmopolitan early Palaeozoic genus *Phylloporina* from 1900 to the present, with *R. trentonensis* being more commonly cited. Morphological details of *R. angulata* Hall, 1852 and *R. angulata* sensu Foerste, 1887 have only recently been determined. They are not consistent with the morphology of species assigned to and described as *Phylloporina*, even by authors who have cited *R. angulata* as the type species, whereas virtually all adequately described *Phylloporina* species appear to be congeneric with *R. trentonensis*. We request that *R. trentonensis* be designated as type species in conformity with the current concept of the genus.

Keywords. Nomenclature; taxonomy; Bryozoa; Phylloporinina; PHYLLOPORINIDAE; *Phylloporina*; *Retepora angulata*; *Retepora trentonensis*; bryozoans; Palaeozoic.

1. In the mid-1880s E.O. Ulrich finished a large manuscript entitled ‘Palaeozoic Bryozoa’, to be published in the eighth and final volume of ‘*Geological Survey of Illinois*’ organised by A.H. Worthen. The Illinois State legislature passed an Act in June 1885 for production of volume 8 within two years (Lindahl, 1890). Ulrich’s new genus *Phylloporina* was among the numerous new taxa to be named in the paper.

2. Ulrich shared information from his manuscript with at least two palaeontologists, A.F. Foerste and S.A. Miller, including information about his intended new genus *Phylloporina*. However, funding for the Survey itself was exiguous and support for publication of the volumes was intermittent, leading to delays of various lengths, as indicated in the transmittal letter for volume 6 of ‘*Geological Survey of Illinois*’ (Kent, 1982, p. 4). Substantial problems plagued the production of volume 8, which did not go to the printer until early 1889, about a year after Worthen’s death, with a further delay of a year and a half before printing was accomplished in 1890 (Lindahl, 1890, p. v).

3. The name *Phylloporina* first appeared in print in a paper by A.F. Foerste as 'Genus PHYLLOPORINA, Ulrich' (Foerste, 1887, p. 150). Only one species, 'Phylloporina angulata, Hall' was mentioned in the paper, which had two entries in the synonymy, both of which were secondary references to *Retepora angulata* Hall, 1852 (p. 49) but both of which were by Hall (Hall & Whitfield, 1875; Hall, 1883). The specimens that Foerste (1887) identified as *Phylloporina angulata* Hall were from the Silurian Clinton Group at 'Soldiers' Home Quarries, Brown's Quarry, Fair Haven, Todd's Fork', [Dayton], Ohio; they were characterised on pages 151 and 152 of the paper. *Retepora angulata* Hall, 1852 (p. 49) as assigned to *Phylloporina* by Foerste (1887, p. 151) is therefore by monotypy the type species of *Phylloporina* according to Article 68.3 of the Code.

4. Foerste (1887) made reference to plates accompanying his paper that were intended to illustrate *Phylloporina angulata* (intended Plates 15 and 17) and other taxa, but the accompanying plates were omitted when his paper was published. Plates 15 and 16 were published the following year (1888, *Bulletin of the Scientific Laboratories of Denison University*, volume 3), but Plate 17 was never published. Unfortunately, the single enigmatic illustration of *P. angulata* on Plate 15 is a generalised drawing of the 'small form for which the name *P.* [sic] *Daytonensis* was suggested by Hall and Whitfield' (Foerste, 1887, p. 174). Plate 17 was to include drawings of the obverse and reverse sides as well as a tangential section of typical '*P. angulata*' material from Ohio (Foerste, 1887, p. 175), but never appeared.

5. S.A. Miller's '*North American Geology and Palaeontology*' appeared in 1889 and included all of Ulrich's (1890) new bryozoan genera in his listing of taxa, and Ulrich himself listed the combination *Phylloporina trentonensis* (Nicholson) in a paper that appeared a year earlier than his own volume (Ulrich, 1889, p. 47).

6. Ulrich (1890, p. 399) not only listed 'Phylloporina n. gen.' but established 'Family Phylloporinidae n. fam.' based on it when volume 8 finally appeared. In that paper, he designated 'Types: *Phylloporina trentonensis* Nich., and *P. asperato-striata* Hall' (Ulrich, 1890, p. 399), illustrating both species in multiple thin section views. He later (Ulrich, 1895, p. 208) listed only *P. trentonensis* as the type species. Neither species listed by Ulrich (1890) as the 'Types' is the valid type species because the type species had already been fixed as indicated in paragraph 3 above.

7. Several species were listed as *Phylloporina* by Nickles & Bassler (1900), but the only assessment of *Chasmatopora* Eichwald – cited as 1860 rather than the original 1855 paper – was 'This appears to be a *Phylloporina*' (p. 55). A decade later Bassler (1911, p. 169) realised, given the precedence of *Chasmatopora* Eichwald, 1855 (p. 460) that *Phylloporina* needed to be considered as a junior synonym based on the information available. He noted (p. 169), however, that 'As pointed out by Ulrich, several distinct types of structure are included in *Phylloporina*. It is therefore probable that with more study both *Phylloporina* and *Chasmatopora* may be recognized.' Foerste (1919) apparently followed Bassler's acceptance of *Phylloporina* as a junior synonym of *Chasmatopora* and included *Chasmatopora angulata* (Hall, 1852) in a taxonomic list (p. 369), the same species that he had described in 1887 as '*Phylloporina angulata*, Hall'.

8. The first morphologically based characterisation of differences between *Chasmatopora* and *Phylloporina* appears to have been given by Bekker (1921, p. 48): 'In the material that I have at my disposal, may be noticed two types. Seen in transverse

sections one type has the zooecial tubes more or less regularly disposed on one side of the zoarial rounded branch; this type could include all species of the gen. *Chasmatopora*. The other type is with zooecial tubes irregularly disposed throughout the whole branch of zoarium. This type could include the species of the gen. *Phylloporina* Ulrich.' With this statement Bekker succinctly stated the most conspicuous of several differences that separate *Chasmatopora* from subsequently evolving common usage of *Phylloporina*.

9. Between 1921 and 1960 there was instability in use of the names *Chasmatopora* and *Phylloporina*. Bassler (1935), Nekhoroshev (1936) and Shulga-Nesterenko (1955) used *Chasmatopora* as a senior synonym of *Phylloporina*. In other publications *Chasmatopora* was treated as a synonym either of *Subretepora* d'Orbigny, 1849 (Shulga-Nesterenko, 1952, p. 18) or of *Phylloporina* (Toots, 1952, p. 120; Männil, 1958, p. 330). Bassler (1953, p. G116) recognised *Phylloporina* as a valid genus and (p. G117) listed *Chasmatopora* as a synonym of *Subretepora*. There was no discussion of why precedence was given to one name or the other in these papers. The type species of *Subretepora* is *Intricaria ? reticulata* Hall, 1847, unrecognisable from its original description (Hall, 1847, p. 77) and not represented by any type material. It has not been redescribed since an enigmatic description by Ulrich (1895, p. 210) that was not based on original type material. *Subretepora* has been considered an unrecognisable genus since 1890, aside from the two listings cited above and an unelaborated inclusion of the unattributed name *Subretepora fenestrata* in a faunal list (Titus, 1986, p. 820).

10. *Chasmatopora* and *Phylloporina* were treated as different genera within the family PHYLLOPORINIDAE in the bryozoan volume of 'Osnovy paleontologii' (Shulga-Nesterenko et al. 1960, p. 76). Brief characterisation of the two genera was based on external and internal features of the type species listed in the volume: *Retepora tenella* Eichwald, 1840 (p. 207) for *Chasmatopora* and *Retepora trentonensis* Nicholson, 1875 (p. 37) for *Phylloporina*. In that volume there was no discussion of the history of tangled usage of the names *Subretepora*, *Chasmatopora*, and *Phylloporina*. However, shortly thereafter Nekhoroshev (1961), one of Shulga-Nesterenko's coauthors for 'Osnovy paleontologii', discussed and gave his opinions on the main points of the history and applied the names *Chasmatopora* and *Phylloporina* to new species consistent with their characterisation in 'Osnovy paleontologii'.

11. Even before the publication of the bryozoan volume of 'Osnovy paleontologii' the characterisations given in it had become the foundation for the common understanding of the two genera. Among the numerous species described as *Phylloporina* since 1890, of the 18 that have been characterised sufficiently to consider their taxonomic affinity, all have morphology suggesting close alliance with that of *Retepora trentonensis* Nicholson, 1875 and one additional species has some characteristics allied with *R. trentonensis* and other characteristics allied with *R. tenella* Eichwald, 1840 (McKinney & Wyse Jackson, 2010). Six others are too sketchily characterised to compare.

12. Except for *Intricaria ? reticulata* Hall, 1847, the taxonomy of the species involved has recently been stabilised by redescription and designation of a single name-bearer specimen. Lavrentjeva (1985, p. 43) designated as neotype of *Retepora tenella* Eichwald, 1840 (type species of *Chasmatopora*) Paleontological Institute

(Moscow) specimen 3535/76, from the Vormsi Stage, Upper Ordovician, Palukula, Hiiumaa island, Estonia. McKinney & Wyse Jackson (2010) recognised and re-described as *Chasmatopora foerstei* the material studied by Foerste (1887) and assigned by him to *Phylloporina angulata* (Hall). They designated specimen USNM 84851 (United States National Museum) from the Clinton Group, Niagaran, Silurian, Soldiers' Home Quarries, Dayton, Ohio, U.S.A. as holotype. McKinney & Wyse Jackson (2010) designated as lectotype of *Retepora angulata* Hall American Museum of Natural History (AMNH) specimen 30711, from the Clinton Group, Niagaran, Silurian, Hill's Mill, Wayne County, New York, U.S.A., and questionably assigned the species to *Chasmatopora*. McKinney & Wyse Jackson (2010) designated as neotype of *Retepora trentonensis* Nicholson (Ulrich's intended type species of *Phylloporina*) Natural History Museum, London (NHM) specimen PD5374, from the Trenton Limestone, Trentonian, Ordovician, Belleville, Ontario, Canada.

13. Both *Retepora angulata* Hall (Ross, 1963, 1964; Kopaevich, 1975; Karklins, 1985; Bolton & Cuffey, 2005) and *R. trentonensis* Nicholson (Bassler, 1935, 1953; Männil, 1958; Shulga-Nesterenko et al., 1960; Nekhoroshev, 1961; Dessilly, 1967; Lavrentjeva, 1985; Morozova et al., 2003; Ernst & Carrera, 2008) have been given as type species of *Phylloporina* in taxonomic papers from 1900 forward. The characteristics of *R. angulata* have previously been so poorly known that even those who have given *R. angulata* as the type species consistently have named new species or discussed established species that have affinities with *P. trentonensis* rather than with *P. angulata* (McKinney & Wyse Jackson, 2010).

14. *Chasmatopora* and the prevailing usage of *Phylloporina* are so different from one another that Shulga-Nesterenko (1955, p. 104) discriminated the new subfamily CHASMATOPORINAE, which was recanted by Shulga-Nesterenko et al., 1960 (p. 76). CHASMATOPORINAE was subsequently raised to family level as CHASMATOPORIDAE by Lavrentjeva (1979) as one of two families in the new suborder Phylloporinina Lavrentjeva, 1979.

15. *Retepora angulata* Hall sensu Foerste, 1887 is a species of *Chasmatopora* (*C. foerstei* McKinney & Wyse Jackson, 2010). Its retention as type species of *Phylloporina* Ulrich in Foerste, 1887 would make *Phylloporina* a subjective junior synonym of *Chasmatopora*. *Phylloporina* in the primary sense intended by Ulrich, with *Retepora trentonensis* Nicholson as type species, is a widely recognised genus worldwide and is the taxon on which the family PHYLLOPORINIDAE and the suborder Phylloporinina ultimately are based.

16. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary power to set aside all previous type species fixations for the nominal genus *Phylloporina* Ulrich in Foerste, 1887 and to designate *Retepora trentonensis* Nicholson, 1875 as the type species;
- (2) to place on the Official List of Generic Names in Zoology the name *Phylloporina* Ulrich in Foerste, 1887 (gender: feminine), type species by designation in (1) above *Retepora trentonensis* Nicholson, 1875;
- (3) to place on the Official List of Specific Names in Zoology the name *trentonensis* Nicholson, 1875, as published in the binomen *Retepora trentonensis* (specific name of the type species of *Phylloporina* Ulrich in Foerste, 1887, as ruled in (1) above).

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